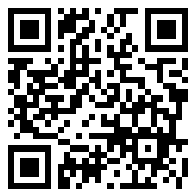

This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

GoogleTM books

<https://books.google.com>

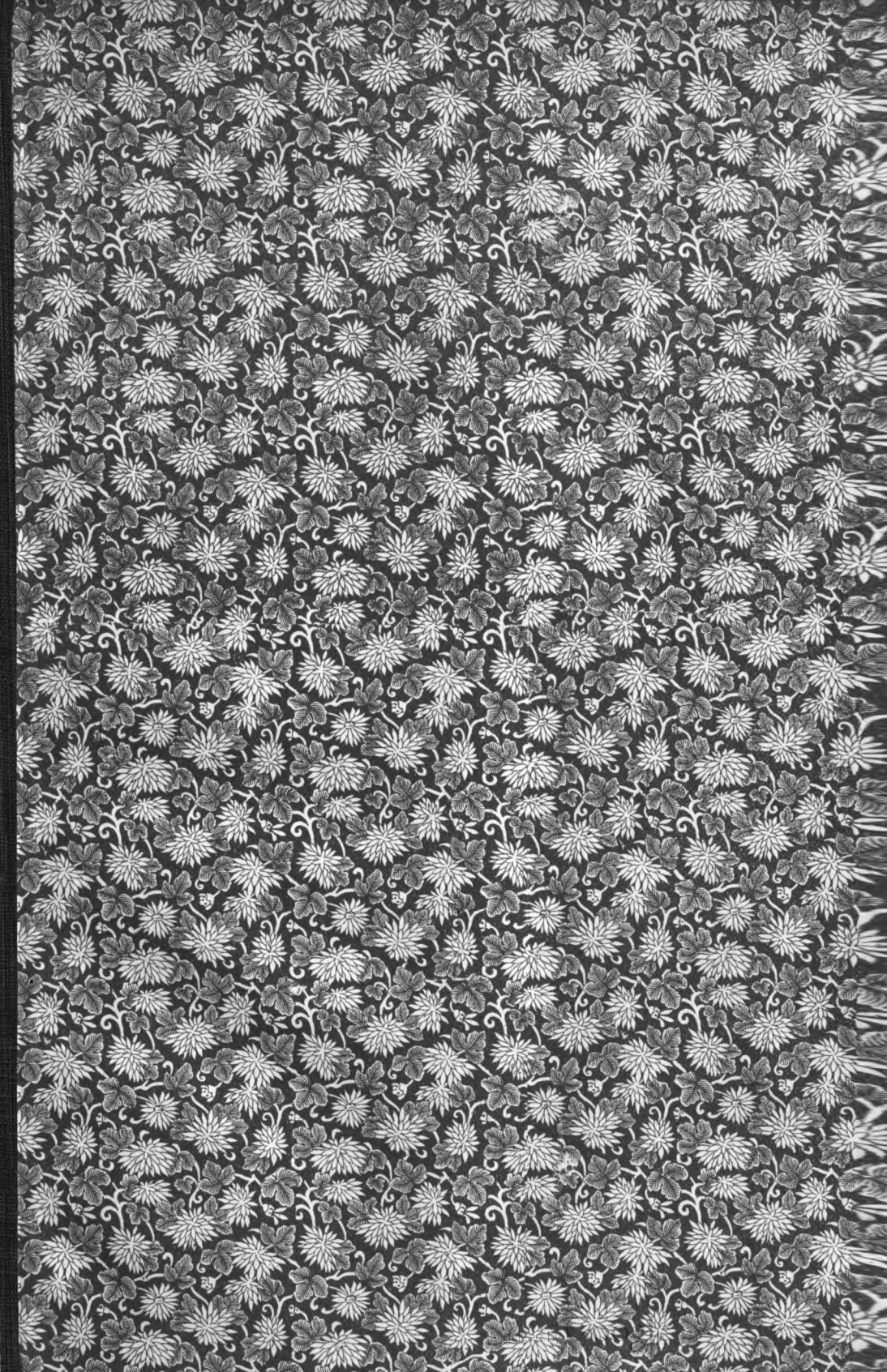


THE LIBRARY



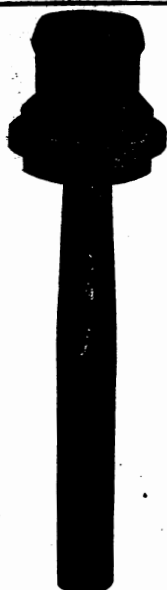
SCI-TECH COLLECTION

February, 1968



Life 24

Missing page(s)

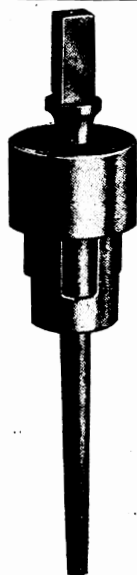


The Improved Sectional Beading Expander

The strongest and best expander made; operated by hand, No. 80 Boyer Riveting Hammer or Jam Riveter

Our Roller Expanders

are the simplest and best. We make seven different patterns. Both hand and self feeding.



Sent Anywhere on Trial

SEND FOR CATALOGUE No. 25

J. FAESSLER MFG. CO., Moberly, Mo.



MOTORS

FOR
Direct Current for Every Service.

Burke Electric Company

MANUFACTURERS OF

A. C. & D. C. MACHINERY

Main Office and Works: ERIE, PA.

NEW YORK: 26 Cortlandt Street.

PITTSBURG: Park Building.

KANSAS CITY: W. T. Osborn & Co.

CLEVELAND: Adams & Downs, New England Bldg.

MOTORS

FOR

Alternating Current—Two Phase and Three Phase



When writing to Advertisers please mention Ideal Power.

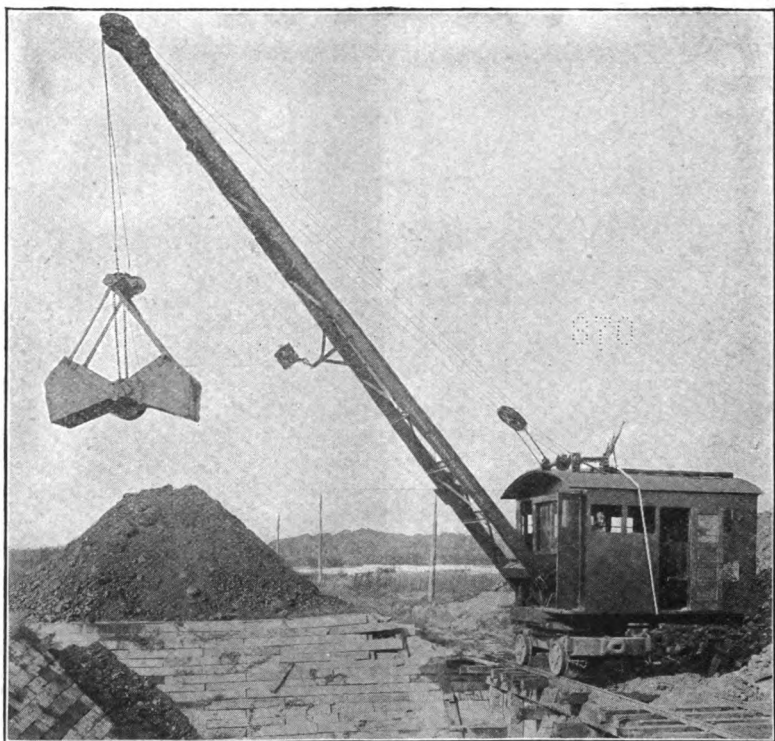
THE BROWNING ENGINEERING COMPANY

CLEVELAND, OHIO

BUILDERS OF

LOCOMOTIVE CRANES

TO OPERATE UNDER EITHER STEAM OR ELECTRIC
POWER. ALSO CRAB BUCKETS, HOISTING
AND CONVEYING MACHINERY.



¶ Time and labor saving CRANES enter largely into the successful and economical operation of factories, large or small. The equipment that gives the greatest efficiency. Let us tell you more about them.

When writing to Advertisers please mention Ideal Power.

Missing page(s)

Chicago Hose Clamp Tool

HOSE SHIELD

No tool box or tool room complete without them. Every householder needs them in connection with garden hose if for no other purpose.



Each complete outfit is contained in a box and consists of the following articles:

Hose Clamp Tool
36 Hose Shields
12 Annealed Wires
1 Lock Nut
1 Pair Pliers



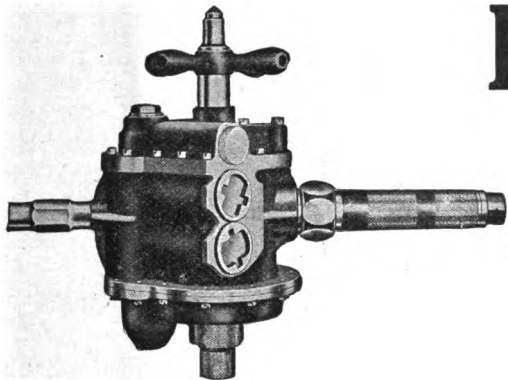
**ONCE USED
ALWAYS USED**

MANUFACTURED BY

**Chicago Pneumatic Tool
Company**
CHICAGO **NEW YORK**

When writing to Advertisers please mention Ideal Power.

"LITTLE GIANT" DRILLS



No. 22 "Little Giant" Drill with our new reversing throttle handle. For heavy drilling and tapping we equip same with compound planetary gearing.

Are made in the various types and sizes to meet every requirement of the modern Railway and Industrial shop—they have been time tried and have proved their

Reliability and Efficiency

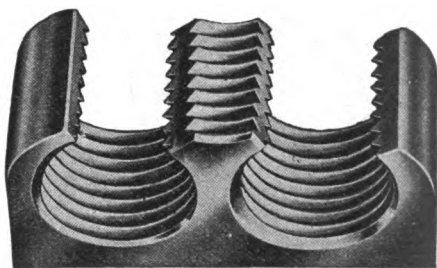
If you have any other make of tools, keep a record of the number of times each make goes into the tool room for repairs, and you will soon be convinced of the **Reliability** of the "Little Giant."

Those who copy the "Little Giant" are no doubt building a better tool than they could otherwise—**But a copy is never as good as the original.**

MANUFACTURED BY

**Chicago
Pneumatic Tool
Company**

CHICAGO - NEW YORK



Sample of tapping accomplished with the No. 22 "Little Giant" Drill, equipped with compound planetary gearing, $1\frac{1}{2}$ inch steel through which $1\frac{1}{2}$ inch. 6 thread U. S. Standard Tap has been run.

Missing page(s)

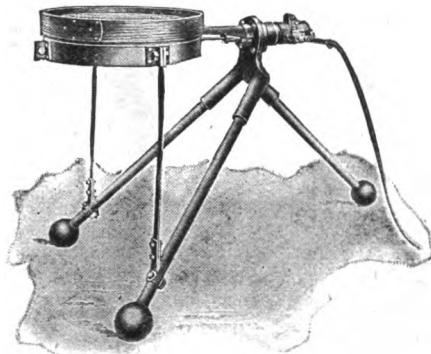
FOUNDRY APPLIANCES



"Keller" and
"Chicago"
Sand
Rammers

For various purposes, including Hammers for Chipping, Broaching and Scaling; also Grinders, Buffers, Drills, etc.

They are Simple, Durable, Reliable and fully guaranteed.



Chicago Tripod Sand Sifter No. 1.

We also manufacture Post and Self-Cleaning Sifters.

"Keller" and "Chicago" Sand Rammers are absolutely the only successful Rammers ever produced. Thousands in use, in foundries, of various classes. They are especially adapted to ramming Pipe and Ingot moulds.

Catalogs and Prices furnished on request.

MANUFACTURED BY

CHICAGO PNEUMATIC TOOL COMPANY
CHICAGO NEW YORK

Missing page(s)

IDEAL POWER

Published Monthly in the Interest of Compressed Air and Electrical Appliances
By THE IDEAL POWER PUBLISHING COMPANY
Fisher Building : : : : Chicago

Vol. 5.

CHICAGO, OCTOBER, 1908.

No. 7.

Increased Economy in the Production of Steel The New Plant of The Indiana Steel Company, Gary, Indiana

For more than two years past the attention of the civilized world has been directed towards Gary, Ind., where an achievement unique in the annals of industrial history is at present in process of realization. Upon the shifting sand dunes of northern Indiana, at a point where the Grand Calumet flows into Lake Michigan, twenty-three miles east of Chicago, there are being built, in record time, a city, a harbor and enormous steel works, the largest of their kind in the world. This is all in behalf of one corporation, the Indiana Steel Company, which has secured here a site of 9,000 acres, with a lake frontage of one and three-quarter miles, on which to erect both the mills and a residence city for its employees.

Upon a visitor entering the plant, the first and overwhelming impression is that of magnitude; the second, resulting from close inspection, is of completeness coupled with simplicity; the third and most interesting concerns the practical elimination of waste. From these factors, as a natural resultant, comes "economy," the much-sought necessity of the present industrial world. Here it has been worked out with mathematical certainty.

During a decade or two past the relative cost of producing iron and steel, as compared with the constantly increasing scales of wages paid to workmen, has been re-

duced largely through the substitution, first, of mechanical appliances for manual labor and then of improved machinery and methods. This change has been and is still taking place all along the line, from the stripping and removal of ore beds by steam shovels to the loading of the finished rails, plates or structural parts on cars ready for shipment. At every stage of the process, where new apparatus is used, if the machinery has been wisely designed, properly installed and efficiently operated, costs have been proportionately reduced and a final cheaper—usually better—product made possible.

Of late, however, there have come about still more important refinements in steel mill practice, due both to improved metallurgical processes and to the necessity of supplementing these by methods for utilizing the inevitable waste—which, consequently, is fast disappearing as "waste" and reappearing as "by products."

POWER FROM BLAST FURNACE GAS.

For the benefit of those who have no intimate knowledge of the manufacture of steel, it may be well to state, in explanation of what follows, something of the first steps of the process. When pig iron is to be made, coke, ore and limestone are put in layers in the blast furnaces and then the fires are lighted. A powerful blast of heated air is sent through the burning

CONVENTION DATES.

October 6, 1908—National Convention of Railroad Commissioners, Washington, D. C.
 October 12-16, 1908—American Street and Interurban Railway Association, Atlantic City, N. J.

October 20, 1908—Association of Railway Superintendents of Bridges and Buildings, Washington, D. C.

October 12-16, 1908—American Street and Interurban Manufacturers' Association, Million Dollar Pier, Atlantic City, N. J.

October, 1908—Railway Signal Association.
 November 10-11-12, 1908—Roadmasters and Maintenance of Way Association of America, Milwaukee, Wis.

November 18, 1908—American Railway Association, Chicago.

November 30-December 1—American Society of Refrigerating Engineers, New York.

January, 1909—Illinois Society of Engineers and Surveyors, Chicago, Ill.

January 15, 1909—Technical Society of the Pacific Coast, San Francisco, Cal.

January 19-21, 1909—The American Society of Heating & Ventilating Engineers, 29 W. 39th St., New York.

ENGINEERING SOCIETIES, ETC.

American Institute of Electrical Engineers—President, Henry Gordon Stott, 600 W. 59th St., New York City; Secretary, Ralph W. Pope, 33 W. 39th St., Engineers' Building, New York, N. Y.

American Institute of Mining Engineers—President, James Gayley, 71 Broadway, New York; Secretary, R. W. Raymond, 99 John St., New York.

American Society of Civil Engineers—President, Geo. H. Benzenberg, Milwaukee, Wis.; Secretary, Charles Warren Hunt, 220 W. 57th St., New York.

American Society of Mechanical Engineers—President, M. L. Holman, St. Louis, Mo.; Secretary, Calvin W. Rice, 29 W. 39th St., New York.

American Society of Heating and Ventilating Engineers—President, C. B. J. Snyder; Secretary, W. M. Mackay, 29 W. 39th St., New York.

American Society of Naval Engineers—President, R. S. Griffin, Navy Dept., Washington, D. C.; Secretary, Theo. C. Fenton, Navy Dept., Washington, D. C.

American Society of Refrigerating Engineers—President, Edgar Penney, Newburg, N. Y.; Secretary, Wm. R. Ross, Tribune Bldg., New York.

Association of Civil Engineers, Cornell University—President, J. G. Schurman, Ithaca, N. Y.; Secretary, C. L. Crandall, care Cornell Univ., Ithaca, N. Y.

Association of Engineering Societies—Fred Brooks, Secretary, 31 Milk St., Boston, Mass.

Boston Society of Civil Engineers—President, Joseph R. Worcester, 79 Milk St., Boston; Secretary, Fred Brooks, 31 Milk St., Boston.

Brooklyn Engineers' Club—President, Geo. C. Whipple, 220 Broadway, New York; Secretary, Joseph Strachan, 197 Montague St., Brooklyn.

Canadian Society of Civil Engineers—President, John Galbraith, Toronto; Secretary, Clement H. McLeod, 877 Dorchester St., Montreal.

Civil Engineers' Club of Cleveland—President, Chas. H. Wright, Cleveland, Ohio; Secretary, Joe C. Beardsley, 1200 Schofield Bldg., Cleveland. Meetings are held at room 718 Caxton Bldg., every Tuesday, 8 p. m.

Civil Engineers' Society of St. Paul—President, C. S. Annan, 2120 Scudder St., St. Paul; Secretary, G. O. House, 76 West Third St., St. Paul.

Connecticut Society of Civil Engineers—President, Daniel S. Bransmade, Derby,

Conn.; Secretary, J. Frederick Jackson, Box 1304, New Haven, Conn.

Detroit Engineering Society—President, Benjamin Douglas, care M. C. R. R., Detroit, Mich.; Secretary, Clarence W. Hubbell, care of Water Office, Detroit.

Engineering Association of the South (1904)—President, Geo. M. Ingram, Nashville, Tenn.; Secretary, Howard M. Jones, care N. C. & St. L. Ry., Nashville.

Engineers' Club of Cincinnati—President, H. C. Inness; Secretary, E. A. Gast, P. O. Box 333, Cincinnati, Ohio. Meets third Thursday each month, except July and August.

Engineers' Club of Minneapolis—President, James B. Gilman, Minneapolis, Minn.; Secretary, O. P. Bailey, 935 Lumber Exchange, Minneapolis.

Engineers' Club of Philadelphia—President, H. W. Spangler, Univ. of Penn., Philadelphia, Pa.; Secretary, H. G. Parring, 16 S. Broad St., Philadelphia, Pa. Meetings first and third Saturdays each month, except July and August, 3:15 p. m.

Engineers' Club of St. Louis—President, W. A. Layman, 2017 Locust St., St. Louis, Mo.; Secretary, R. H. Fernald, 3817 Olive St., St. Louis, Mo.

Engineers' Society of Western New York—President, Louis H. Knapp, 366 Ellicott Square, Buffalo; Secretary, Thos. J. Rogers, Municipal Bldg., Buffalo.

Engineers' Society of Western Pennsylvania—President, J. K. Lyon; Secretary, Richard Hirsch, 803 Fulton Bldg., Pittsburgh. Meetings third Tuesday of each month, except July and August.

Illinois Society of Engineers and Surveyors—President, Charles B. Burdick, Chicago, Ill.; Secretary, E. E. R. Tratman, 1636 Monadnock Block, Chicago.

Illuminating Engineering Society—President, L. B. Marks, 220 Broadway, New York; Secretary, A. H. Elliott, 4 Irving Pl., New York.

Indiana Engineering Society—President, W. K. Hatt, Purdue University, Lafayette, Ind.; Executive Secretary, Chas. Grossman, 408 Commercial Club, Indianapolis, Ind.

Iowa Engineering Society—President, Arthur J. Cox, Iowa City; Secretary, A. H. Ford, Iowa City, Iowa.

Louisiana Engineering Society—President, W. H. Hoffman, Cotton Exchange Bldg., New Orleans; Secretary, Marcel Gersaud, 1027 Elenore St., New Orleans.

Memphis Engineers' Society—Secretary, J. H. Weatherford, Memphis, Tenn.

Michigan Engineering Society—President, Dorr Skeels, Grand Rapids, Mich.; Secretary, F. Hodgman, Climax, Mich.

Montana Society of Engineers—President, Archer E. Wheeler, Great Falls, Mont.; Secretary, Clinton H. Moore, Butte, Mont.

Ohio Engineering Society—President, G. A. McKay, City Engineer, Xenia, Ohio; Secretary, E. B. Bradbury, 85 N. High St., Columbus, Ohio.

Pacific Northwest Society of Engineers—President, James C. Jeffrey, Seattle, Wash.; Secretary, Arthur H. Dimock, Lowman Bldg., Seattle, Wash.

Purdue University Engineering Societies—Lafayette, Ind.

Rochester Engineering Society, Rochester, N. Y.—President, Chas. L. Raymond, Rochester, N. Y.; Secretary, J. F. Skinner, 52 City Hall, Rochester, N. Y.

Scranton Engineers' Club—President, E. M. Zehnder, 742 Madison Ave., 921 Vine St., Scranton, Pa.

Technical Society of the Pacific Coast—President, George W. Dickie, San Mateo, Calif.; Secretary, Otto von Geldern, 1978 Broadway, San Francisco.

Toledo Society of Engineers—President, T. D. Wickenden, 602 Starr Ave., Toledo, Ohio;

Secretary, John C. Oliphant, 404 Batavia St., Toledo. Regular meetings second Friday of each month.

Western Society of Engineers—President, C. F. Loweth, 1734 Monadnock Block, Chicago; Secretary, J. H. Warner, Monadnock Block, Chicago, Ill. Regular meetings first Wednesday; extra meetings generally third Wednesday, each month, except July and August.

MECHANICAL AND TRADE SOCIETIES.

Air Brake Association—President, Geo. R. Parker; Secretary, F. M. Nellis, 53 State St., Boston, Mass.

American Society of Steam Engineers—Supreme Chief Engineer, J. Diedrich, 226 North Carolina St., Baltimore, Md.; Supreme Corresponding Engineer, Frederick Markoe, 931 North Orleans St., Baltimore, Md.

American Railway Association—President, W. C. Brown, New York City; Secretary, W. F. Allen, 24 Park Pl., New York City.

American Railway Engineering and Maintenance of Way Association—President, A. W. Johnson, N. Y. C. & St. L. Ry., Cleveland, Ohio; Secretary, E. H. Fritch, 962 Monadnock Block, Chicago, Ill.

American Railway Master Mechanics' Association—President, Wm. McIntosh, S. M. P. Cent., Ry. of N. J.; Jersey City, N. J.; Secretary, J. W. Taylor, 390 Old Colony Bldg., Chicago.

American Society of Railroad Superintendents—President, W. L. Derr, Erie R. R., Elmira, N. Y.; Secretary, C. A. Hammond, Mt. Vernon, N. Y.

American Street and Interurban Railway Association—President, Calvin G. Goodrich, care Twin City Rapid Transit Co., Minneapolis, Minn.; Secretary, B. V. Swenson, Engineering Societies' Building, 29 West 39th St., New York City.

Engineering Association—President, H. H. Adams, Baltimore, Md.; Secretary, S. Walter Mower, London, Canada.

American Street and Interurban Railway Manufacturers' Association—President, Jos. R. Ellicott, care Westinghouse Traction Brake Co., New York City; Secretary, Geo. Keegan, 2304 Park Row Building, New York City.

Association of Maintenance of Way Master Painters (United States and Canada)—President, A. B. Phelps, L. S. & M. S. Ry., Cleveland, Ohio; Secretary, H. J. Schnell, 100 William St., New York City.

Association of Railway Superintendents of Bridges and Buildings—President, R. H. Reid, L. S. & M. S. Ry., Cleveland, Ohio; Secretary, S. F. Patterson, B. & M. R. R., Concord, N. H.

American Boiler Manufacturers' Association—President, M. F. Cole, Newman, Ga.; Secretary, J. D. Farasey, First St. & Erie Ry., Cleveland, Ohio.

Canadian Association of Stationary Engineers—President, F. Grandbois, Chatham, Ontario, Canada; Secretary, W. A. Crockett, Mount Hamilton, Ontario, Canada.

Canadian Roadmasters' Association—President, A. McAley, Can. Pac. Ry., Toronto Junction, Ontario, Canada.

Car Foremen's Association of Chicago—President, T. H. Goodnow, L. S. & M. S. Ry., Chicago; Secretary, Aaron Kline, 326 N. 50th Ct., Chicago, Ill. Regular meetings second Monday night each month, Room 811, Masonic Temple, Chicago.

Engine Builders' Association of United States—President, C. A. Gates; Secretary, J. I. Lyle, 59 Courtland St., New York City.

International Railroad Master Blacksmiths' Association—President, Geo. H. Judy, B. & O. R. R., Lima, Ohio; Secretary, A. I. Woodworth, C., H. & D. Ry., Lima, Ohio.

International Railway General Foremen's Association—President, E. F. Fay, U. P. Ry.,

Cheyenne, Wyo.; Secretary, E. C. Cook, 506 Royal Insurance Bldg., Chicago, Ill.; Treasurer, Frank Hunt, Susquehanna, Pa.

International Master Boiler Makers' Association—President, George Wagstaff, New York Central Lines, Buffalo, N. Y.; Secretary, Harry D. Vought, 62 Liberty St., New York City.

International Union of Steam Engineers—President, Matt Comerford, 510 E. 8th St., Brooklyn, N. Y.; Secretary, Robert A. McKee, 606 Main St., Peoria, Ill.

Master Car and Locomotive Painters' Association—President, B. E. Miller, Lackawanna Ry., Kingsland, N. J.; Secretary, A. P. Dane, B. & M. R. R., Boston, Mass.

Master Car Builders' Association—President, Geo. N. Dow, L. S. & M. S. Ry., Cleveland, Ohio; Secretary, J. W. Taylor, 390 Old Colony Building, Chicago, Ill.

National Association of Cement Users—Secretary, W. W. Curtis, 344 Dearborn St., Chicago, Ill.

National Association of Stationery Engineers—President, Jos. F. Carney, 726 Beck St., Bronx, N. Y.; Secretary, F. W. Raven, 325 Dearborn St., Chicago, Ill.

National Electric Light Association—President, Dudley Farrand, Newark, N. J.; Secretary, W. W. Freeman, 29 N. 39th St., New York City.

Railway Signal Association—President, A. H. Rudd, P. R. R., Philadelphia, Pa.; Secretary, C. C. Rosenberg, 12 Linden St., Bethlehem, Pa.

The Railway Supply Manufacturers' Association—President, R. T. Walbank; Secretary, Earl G. Smith, 241 Railway Exchange Building, Chicago.

Railway Store Keepers' Association—President, J. M. Taylor, I. C. Ry., Chicago; Secretary, J. P. Murphy, Box C, Collinwood, Ohio.

Road and Track Supply Association—President, W. E. Clark, 401 Marquand Building, Portland, Ore.; Secretary, John N. Reynolds, Railway Age, Chicago.

Roadmasters and Maintenance of Way Association—President, C. Ruhner, L. S. & M. S. Ry., Sandusky, Ohio; Secretary, C. E. Jones, C. B. & Q. Ry., Beardstown, Ill.

Traveling Engineers' Association—President, A. M. Bickel, L. S. & M. S. Ry., Elkhart, Ind.; Secretary, W. O. Thompson, N. Y. C. Car Shops, Buffalo, N. Y.

The Curse of Gold.

The rich are very, very bad,
Their hearts are hard, indeed;
It never fails to make them glad
To get more than they need.

On them is laid the curse of gold;
They need not hope for wings;
To old man Satan they have sold
Their souls, the wicked things!

The preachers preach against the rich,
The politicians shout.
About the many troubles which
The rich have brought about.

Of all bad things upon this earth
The curse of gold's the worst;
But men scheme on for all they're worth
So that they may be cursed.

—Chicago Record-Herald.

DUNTLEY ELECTRIC VACUUM CLEANER

Provides a perfect cleaning method for the home at low cost. Operated from the ordinary lamp socket. In addition to the cleaning by vacuum an extra hose is attached for use of compressed air for blowing dirt out of corners, radiators, etc.



Easily handled and taken care of by anyone. Weight 60 lbs. Can easily be carried from floor to floor. Also mounted on rollers making it easily movable. Sent on trial to responsible parties.

FOR SALE BY

CHICAGO PNEUMATIC TOOL COMPANY
CHICAGO—NEW YORK

NECESSITIES

High Grade Rubber Goods
Fire Hose
Reels, Nozzles
Fire Hose Carts.
Rubber Cement
P. & W. Rubber Preservative
Rubber Boots
Leather-Soled Rubber Boots

Leather Belting
Upholsterer's Leather
Leather and Silk Fringes
Vestibule Diaphragms
Gimp
Brass Nails
Leather Head Nails

Signal Flags
Bunting
Linoleum
Cab Cushions
Cab Curtains
Track Jacks
Economy Soap Stock
Nut Locks

G. S. WOOD, 209 Great Northern Bldg., Chicago, Ill.

When writing to Advertisers please mention Ideal Power.

Missing page(s)

ceiving all the law and gospel from his chief, receives general principles only, but himself furnishes his chief with personally perfected standards, which it is the duty of the chief to adjust and incorporate in the general plan.

A staff without general standards, a staff officer without special standards, either expressed or felt, is a misnomer.

The standards of the staff are not scientific abstractions, but are evolved for the use of the line, the sole justification of the standards being that they will make line work more efficient. Staff standards being for the benefit of the line and often intrusted to line officials, must be put in the form of permanent instructions so that all may understand what is being aimed at, and deviations by the line be marked and reprimanded.

During the Cuban campaign, in a road over which many hundred army wagons were to pass, there was a mud hole. The first transport wagon, obeying the command to proceed to destination, floundered into the hole, had to be unloaded, dragged out, and reloaded. The crew had neither authority, skill, nor equipment to mend roads, so they passed on. Also there were no written staff instructions as to what a line official should do when he found the road impassable, so the second wagon coming along a few hours later, plunged into the same hole and experienced the same delay and trouble. In turn each of the several hundred wagons repeated the same performance, and although this road was in constant use for several months no attempt was made to mend it. Had there been so much sense of staff as in ant-hill activities, the first wagon would not have passed on without bettering the conditions for those who follow, instead of leaving them worse; had there been even elementary staff, one wagon only would have gone into the hole, which would then as a matter of course have been eliminated. Had there been perfected staff, even the first wagon would not have passed over the road until it had been put in condition.

A sign post definitely stating distance, character of road, steepness of grades, to

next town, is not in any way an imposition on or impediment to the wayfarer, whether on foot or in automobile, but is a valuable help. The sign post is a staff, without authority, except as imposed on the line by a line officer, a staff without value except as to its own special and limited information.

Staff standards are infinite and ever-changing. The best practice of yesterday is the laughing stock of to-day. The work of the expert is never done. The aeroplane flight of 6 miles last year becomes 60 miles this month, 600 miles next year. The chief of staff, who is to inspire the search for higher standards, who is to handle them with common sense, must himself be governed by elemental natural truths, his standards, used as a test for all the others, and these highest standards are psychical and physiological rather than physical. The four psychological requisites for a chief of staff are: (a) Faith, in men, in equipment, in methods and in standards, (b) an enthusiasm that inspires and creates confidence, (c) ultimate highest ideals, (d) very great rapidity of action.

Faith in men, faith in equipment, faith in methods, faith in standards must be so great as to inspire a contagious enthusiasm not only in the junior staff members but also in all the members of the line from commander-in-chief down to private. No man is fit to be a member of a staff who does not delight in his work, who does not consider it quite the keystone of the arch, who does not bend it wholly to the interests of the line, so that the line will recognize that through staff presence and staff endeavor, line work is made safer, higher, more pleasurable and more profitable.

The chief of staff must believe that the great majority of employes, nine-tenths, at least, can be easily influenced to do what is right, and prefer to do what is right, and that if the right course is made easy, it will be automatically followed, just as most people naturally keep to the sidewalk, although there are no rules ordering them to do so. Policemen are armed with clubs not to intimidate the well behaved many but to terrorize the exceptional few. After the first prejudice against any innovation

is overcome, staff standards must continually appeal to those for whom they are set up.

The chief of staff must assume, until the contrary is proved, that existing equipment and existing facilities utilized to fullest efficiency can meet most requirements, that it is better to improve than to substitute, that Goliath can be slain with a sling and that the western road to India can be discovered with a caravel.

No man is fit to be either chief of staff or staff junior who does not have and adhere to high ideal standards. This fidelity to abstract principles is necessarily foreign to the line. A typesetter is a member of the line. He achieves, obediently following the manuscript; but the proof reader is a member of the staff and maintains standards. Between them, perfect work is turned out.

The chief of staff and all his juniors must be alive to the value of rapidity of action. Seconds, minutes, hours and days are to the staff what hours, days, months and years are to the line. Staff ideals of the value of rapidity are found in the instantaneous action of a boxer or fencer where delay of the hundredth part of a second to meet an expected condition may result in death; are found in the activities of the weather service which receives reports from territory 6,000,000 miles in extent, compiles and digests the information, and publishes to-morrow's weather before noon to-day, to all the world over land and sea; a delay of a few hours would make the whole work valueless. Staff ideals of speed reacting on all the line are found in the work of a daily paper which collects the news of the whole world until the night is half gone, goes to press at two in the morning, and reaches distant customers at 6 a. m.

A proposition was made to the line officers of a large corporation to reduce expenses \$2,000,000 per annum. Whatever the time required to accomplish this, every day's delay caused an irretrievable loss of \$6,666; yet details that ought to have been decided in 8 minutes were allowed to wait for 8 months. Line traditions vitiated staff ideals and as the line lasts forever it

not imbued with speed ideals. It was quite in accordance with line tradition that the wars between France and England lasted 100 years, that the religious wars in Germany last 30 years, that the wars of Frederick the Great lasted 7 years, that the French European wars lasted 26 years, that the war of the American revolution lasted 7 years, the wars of the Rebellion 4 years—but that the staff-prepared war of Von Moltke's Prussian army against twice as strong a territorial and numerical coalition lasted 2 weeks, and Von Moltke's staff-prepared war of Germany against France captured the French emperor and the French armies and ended the French empire in 7 weeks after outbreak.

In line, there is very little planning but a great deal of organization; in staff, it is all planning and very little organization.

Owing to absence of staff as part of their own organization, lines, all over the world, have been forced to depend on outside staffs, whose inspiration was generally tinged with pecuniary self-interest, so that the great shops and railroads and other industrial concerns have been as to men, machines, materials, and methods over-supplied and over-equipped, as when a \$100,000 sawmill is erected to handle a \$50,000 lumber tract. Many hundred million dollars have been spent in the last decade on fanciful betterments, when greater returns could have been obtained by standardizing what was.

In marked contrast to the lavish expenditure for inadequate returns from improvements in industrial and transportation concerns is the small expenditure and enormous return brought about in agriculture. The present depression in the great industrial division of American activity and the almost giddy prosperity of the agricultural division at once illustrate the fundamental difference in results and in methods obtained from line and staff activities respectively. The farmer is not lazy, he is not troubled by union limitations, and he has the enormous spur of direct and personal increase of reward for increased or more intelligent effort; he has moreover been at his business from birth; but the average result in crops is only about 30 per cent of what it ought to be.

There is no reason for assuming that industrial activities, entrusted to men whose interest goes no further than their daily wage, who were not born to the business, will average any higher in efficiency than the farming class, and in fact there is just as much difference between the average crop and the expert's crop as there is between the average output of a man and machine and the expert's output from the same man and machine. Two different influences are revolutionizing agriculture—the isolated special genius, and the staff adviser. The industrial field has had the isolated special genius but as yet very little staff assistance.

Because these essays on efficiency are applicable particularly to shops and railroads it is better to use illustrations from agriculture, since it is much easier to see the mote in the brother's eye than the beam in our own. Therefore the yield of potatoes will be used in illustration. What is the limit of yield of potatoes from an acre of ground in the United States? The average yield per acre over a series of years is 96 bushels. Shall we therefore set 100 bushels as standard 100 per cent efficiency?

The lowest average in 1907, 65 bushels, occurred in the great agricultural state of Kansas; the highest average was in the desert state of Wyoming 200 bushels to the acre. The highest average in Wyoming is due to one man, who issued a challenge of \$1,000 open to all the potato growers of Colorado, that he would raise on his Wyoming farm more potatoes per acre than any one could raise in Colorado, provided further that if he won the contest yet failed to raise 1,000 bushels per acre, he would forfeit the whole of the stakes, \$2,000, to charity.

It is psychology, not soil or climate, that enables a man to raise five times as many potatoes per acre as the average of his own state, ten times as many per acre as the average of the United States, thirteen times as many as the average in the better soil and climate of Kansas. An easily attainable standard of potato raising is therefore not 100 bushels but 500 bushels which can be called 100 per cent efficiency.

On this basis the average of the United

States is 19 per cent, the average of Kansas 12 per cent, the production of the Wyoming champion 200 per cent efficiency. If the United States attained as to potato raising an average efficiency of 50 per cent, the increased value of the crop in one year would be sufficient to pay for the Panama Canal; or, the acreage and labor devoted to potatoes could be reduced to 40 per cent of what it now is, and still yield as many potatoes.

Undoubtedly the potato champion, in a more favorable climate, where, with irrigation, three crops are possible, as in the Yaqui Valley in Mexico, would raise 3,000 bushels per year per acre. They would cost him more per acre but less per bushel than any other potatoes in the world.

Individuals of this kind have inspired the Agricultural Department at Washington, working in conjunction with state agricultural staffs, to standardize conditions for all staple agricultural products.

It has recently been asserted that with selected seed a standard attainable yield of wheat is 50 bushels per acre per year. The actual yield is 14 bushels; the total 650,000,000, when it ought to be 2,500,000,000 bushels—yet there are charity bread lines in New York.

With a standard of 50 bushels per acre the efficiency average of the United States is only 28 per cent, the money loss at constant price over \$1,000,000,000 per year.

The staff experts of the Agricultural Department have enabled Texas cotton growers to raise one bale per acre. Selected seed, suitable fertilizer, systematic cultivation is all that is required. The acreage of cotton is 32,000,000 the production only 12,000,000 bales; the efficiency is 37.5 per cent and the annual loss due to inefficiency about \$1,000,000,000.

Italian bees in California raise twice as much honey as they do in Italy. The Californian bees do not work as hard, they live longer because most of the disagreeable work is eliminated. The staff experts advising the bees are men who standardize conditions both simply and effectively. The bees make honey instead of wasting time on hives, on foundations, on comb, and on long journeys to semi-barren flower fields.

The potato expert increased the efficiency of his field to ten times the average; the owner of Alaskan seed wheat increased his yield to fourteen times the average; the corn and cotton staff experts have through their advice enabled whole counties of farmers to double the average yield of corn and cotton; the making of better conditions has increased the average yield of honey 100 per cent.

If we could put ourselves in touch with the feelings of plants we should probably find that there was much more enjoyment to potatoes in growing 1,000 bushels to the acre than in growing 67 to the acre. Intensity of production does not mean physical exhaustion, but favorable conditions. Similarly, intensity of human production does not legitimately mean, and ought never to mean, the physical exhaustion of an over-worked victim, but should be due to the joyous stimulus of perfectly standardized conditions.

Examples from agriculture have been selected because far more has been done to establish standards of attainable production in agriculture than in factories, shops, and mechanical trades. The plant also will always do the best that circumstances permit and the circumstances are largely controllable. A man will rarely do his best even if circumstances are favorable; but as an offset it is more easy to control factory, transportation, shop and handwork conditions than to control seasons, climates, diseases, and insect pests. On the whole, the efficiencies of industrial organizations are no higher than those of farming activities, and as staff standards indicate possible increases of 200 per cent in agricultural yields, so staff standards and staff assistance will bring about 200 per cent increased efficiency in materials and services in industrial organizations, including railroads. Tests show that this can be done.

The standardizing of belt practice by staff study has increased the average life of belting more than six-fold, has reduced belt failures to one-sixth of what they were, has decreased annual cost to less than one-seventh.

The discovery and perfection of high-speed steels did not originate in any shop

but was exclusively developed by men whose ideals and practices were those of the staff, and high-speed steel accomplishes four or five times as much as the old carbon steels.

Staff selected and designed abrasive wheels cut four times as fast as the old grindstones and every grade needed can be made to order, standardized for each different kind of work; files that are standardized as to quality last five times as long and cut much faster than the usual good commercial files.

Wherever the staff expert turns, he finds that standard time and cost for some units of work can be reduced to one-half, for other units to one-quarter, occasionally to one-tenth, the average time for the unstandardized work.

Railroad practice has many standards, chiefly those of specification, construction, and times for passenger trains. No railroad has ever determined any cost standards either for maintenance or operation of equipment, maintenance of way, or consumption of fuel; yet there is no railroad in the country on which each one of these cost standards could not be determined in a very short time and with very close accuracy, at a cost equal to the saving effected in a single month.

When each unit of locomotive repair is standardized, the sum of the units shows a cost between \$0.03 and \$0.06 a mile for maintenance. The actual average costs on the railroads are between \$0.06 and \$0.12, therefore twice what they ought to be. The standardized cost of maintaining freight cars is as low as \$30 per annum. Actual average costs run from \$45 on some roads to over \$100 on others. Standards of maintenance of way vary, but innumerable assays of actual work show a maintenance-of-way labor efficiency of scarcely more than 30 per cent.

Staff determinations with a dynamo car showed that 1,000,000 B. t. u. in the coal were amply sufficient to furnish power to move a 1,000-ton train one mile. The actual coal charged to locomotives always contained more than twice as many, often three times as many, B. t. u.

The average mileage of the locomotives

of the United States is close to 30,000 per year, about 82 miles per day. Average mileage of a freight car is about 25 miles per day. Staff standardization in locomotive repairs not only decreases the cost to one-half as much per mile, but also increases the mileage at least 33 per cent.

Locomotive repairs cost twice what they should, not because men in charge are not of the highest ability and experience, but because these men are so hampered by line organization that it is almost impossible for them to evolve standards or to maintain standards when evolved. Standards are always of the microscope, of the assayer's balance, of infinite patience applied to the smallest of details. It is not important that absolute zero is at — 273 degrees and that the highest temperature in the sun is 10,000 degrees, but it is important that human life is snuffed out if the temperature of the body rises 5 degrees centigrade.

It is not important that space is so vast that it takes hundreds of light years for the light of distant stars to reach us, wireless telegraphy on a stupendous scale, but it is important that the yellow fever bacillus may lurk in the saliva of a mosquito, so small that the microscope has scarcely yet discovered it.

It is not important that pressure varies from nothing in vacuo to so much at the deepest spots in the sea, that an air bubble taken down there becomes heavier than water and cannot rise to the surface, to so much at the earth's center, even if there were free opening to the surface, that the air would be heavier than gold, harder than titanium, so that a needle could not be driven into it, yet if in it, would slowly move surfacewards until specific gravity of air and needle were the same. These facts, interesting though they are, do not concern us as much as the fact that men cannot work on high mountains without danger nor in caissons without risks of the "bends," and that half the power put into air compression is lost in pipe leaks.

The staff chief and his assistants in search of standards, are not using bolometers to measure the ten-thousandth part of a degree, nor the spectroscope to meas-

ure the speed of advance or recession of the fixed stars, nor ruling diffraction gratings 900,000 lines to an inch, nor are they interested in either the North Pole or in the transit of Venus; but they are searching for common, every-day, practical and attainable standards of which astounding few have been determined.

Time is infinite, but that does not concern us so much as that five minutes of suspension of breathing or heart beating carries us over the boundary that separates life from death.

Congress has determined that a dollar (not now coined) shall consist of 25.8 grains of gold nine-tenths fine, but it may be a shock to learn that Congress has never determined the grain or any other standard of weight or of length or of time. The United States Treasury Department has adopted a gallon and a bushel, but neither is in accordance with the legal standards of Great Britain. They not only differ from the present standards of Great Britain, being respectively 17 per cent and 3 per cent smaller, but they also always differed from the discarded English standards from which they were derived.

On April 15, 1903, the Superintendent of Weights and Measures, not Congress, directed that the international metre and kilogramme should be in the future regarded as fundamental for metric and customary weights and measures. Congress, which has failed to legalize standards either of weight or of length or of capacity, has however standardized the spell of Porto Rico and the motto "In God We Trust" on the dollar, and it is safe to say that Congress has concerned itself more with this motto than with the fact that all the thousands of millions of dollars of railroad and industrial shares sank in October, 1907, 33 per cent in value in a few weeks, and that the earning power of hundreds of thousands of men, eager to work, fell from an average of \$2.00 per day to nothing.

In Germany in the polytechnic schools as late as 1875 and perhaps now, mediaeval standards of proper procedure in all matters appertaining to students' duels were more definite, punctilious, important than surprisingly lacking modern standards of scientific accuracy.

These examples of American legislative and German scholastic insistence in the puerile and neglect of the all-important almost give the dignity of natural law to the statement that in standards insistence and excitement are in inverse proportion to practical every-day importance, and with such high examples as Congress and German Universities it is not surprising that in the line organization of American industrial enterprises there is more sensitiveness about prerogative than in Congress itself, more alertness to take offense at the unimportant than in the German student.

The difficulties blocking the path of the radical improvement that would immediately result from supplementing the line with staff and standards, are the sensitiveness and apprehension of the line that, in some way it cannot explain, staff activity and application of standards will reflect on line ability, as if in the round-the-world automobile race, the benefits of good roads from Berlin to Paris and the speed made over the good roads, reflected on the capacity of the automobile drivers, who made slow yet astonishing progress through Siberia.

THE DEPOSITS OF TWO COUNTRIES.

At the very time when the Comptroller of the Currency makes public the latest reports of the national banks of the United States the latest banking statistics of Great Britain appear. This makes possible some interesting comparisons. The total deposits of all the banks of the United Kingdom including the Bank of England, in July, 1908, amounted to about \$4,575,000,000. The deposits in the national banks of the United States amounted to over \$1,000,000,000 more.

Not only this, but the deposits in the national banks of the United States are growing much more rapidly than the deposits in the banks of the United Kingdom. From 1902 to 1908 the expansion of deposits in the national banks of this country amounted to 48 per cent, while in the same time the deposits in the banks of the United Kingdom increased only 7 per cent. This

is shown by the following table comparing the deposits in the banks of the two countries during the past seven years:

	United Kingdom.	United States.
1908	\$4,575,000,000	\$5,695,509,031
1907	4,525,000,000	5,256,085,097
1906	4,375,000,000	4,927,865,451
1905	4,325,000,000	4,735,477,535
1904	4,175,000,000	4,100,935,409
1903	4,275,000,000	3,863,512,112
1902	4,275,000,000	3,844,365,538

Of course if the deposits in the national banks of the United States and those in the banks of the United Kingdom were reduced to a per capita basis, the banks of the United Kingdom would make a much more favorable showing; but it should be remembered that while the exhibit for the United Kingdom is practically that of all the joint stock banks, including the Bank of England, the exhibit for the United States is only for the national banks, and there are thousands of state banks and trust companies outside of these institutions which carry on much the same class of business. If the aggregate deposits of all the national and state banks and trust companies of the United States for 1907 were compared with the total deposits in the joint stock banks and the Bank of England for the same year, and then reduced to the per capita basis, the comparison would be slightly in favor of the United States. In that year the deposits in the commercial banking institutions of the United States amounted to about \$112 per capita of population, while the deposits in the joint stock banks of the United Kingdom and the Bank of England the same year amounted to about \$108 per capita of population.

These are the two great countries of the deposit currency. Nowhere else in the world is the check system so highly developed as in England and in the United States. Nowhere else in the world is such a vast aggregate of business carried on by means of checks as in these two countries. There has been no more marvellous development of modern business than the growth of this deposit currency.—Wall Street Journal.

COMMERCIAL TRAVELERS.

British Empire.

BRITISH NEW GUINEA.

[Memorandum of British Board of Trade.]

No regulations exist specially affecting the operations of commercial travelers or principals of firms visiting British New Guinea, or agents of British firms residing there.

Samples of no commercial value are not liable to duty, but duty is chargeable on samples of value. Drawback is allowed from any customs port if exportation takes place within two years.

BRITISH NORTH BORNEO.

[Report of Consul Lester Maynard.]

There are no special laws or regulations regarding commercial travelers. Samples of no commercial value are allowed to enter free of duty, but samples which appear to be for sale or of commercial value are subject to duty, which need not be paid, however, until the departure of the traveler from the country.

Commercial travelers are required to supply the customs authorities with a list of the samples that they bring into the country, and, on their departure, they will be charged duty for any samples which have been sold.

The treatment of commercial travelers and samples of merchandise is the same, irrespective of the country from which they or the merchandise may come.

CEYLON.

[Statement of Principal Collector of Ceylon, Transmitted by Consul E. A. Creevey.]

There are no formal rules governing the treatment of commercial travelers, and no discrimination is made between commercial travelers from the United States and those of other nationalities.

Samples brought by commercial travelers are treated as passengers' baggage and are passed free of duty on a declaration on honor, to be made before the principal collector, as to the contents. They are, of course, liable to examination at the discretion of the customs officers.

At the time of making the declaration the commercial traveler is required to make a

deposit with the custom-house covering the amount of duty calculated according to the customs tariff on the declared contents and value. This deposit is refunded when the goods are re-exported. To obtain the refund, proof of re-export is required to be furnished and the customs officials must be given an opportunity to examine the cases in order to identify the goods.

In case of jewelry, plate and articles of great value, in order to avoid an examination at the jetty, it is as well to apply for the service of a customs officer to see the articles packed, who will then seal the cases, and if the seals are intact the cases will be passed at the jetty without further examination.

CYPRUS.

The conditions as to admission of commercial travelers and samples are similar to those prevailing in Malta.

FALKLAND ISLANDS.

[Memorandum of British Board of Trade.]

There are no regulations or restrictions affecting commercial travelers.

FEDERATED MALAY STATES.

[Memorandum of British Board of Trade.]

No regulations are in existence specially affecting any class of commercial travelers. No import duties are levied except on liquors and opium, and small quantities of the former brought by commercial travelers as samples are generally passed duty free.

FIJI ISLANDS.

[Memorandum of British Board of Trade.]

No licenses are required by commercial travelers visiting the Fiji Islands, and no special regulations exist affecting their operations. Samples are liable to duty in the ordinary way, but three-fourths of the amount paid is allowed as drawback on their reexportation, provided this takes place within three years; goods may be shipped from any port of entry (not necessarily that by which they entered) and obtain drawback.

GIBRALTAR.

[Memorandum of British Board of Trade.]

There are no regulations governing commercial travelers and no license fees or taxes are imposed. Spirituous liquors, tobacco, and its manufactures are the only dutiable articles, and small samples of these

are admitted free at the discretion of the revenue authorities.

HONGKONG.

[Report of Consul-General A. P. Wilder.]

This is a free-trade colony, without custom-house, and neither as to the admission of samples nor as to treatment of commercial travelers is there any reference in the ordinances, laws, or regulations of the colony of Hongkong.

INDIA.

[Statement of Department of Commerce and Industry, Transmitted by Consul-General Wm. H. Michael.]

No special regulations or taxes exist in any province of British India affecting commercial travelers visiting India. Such travelers are not required to make out licenses to carry on their calling. But foreigners, other than officials, are prohibited from entering the Manipur and Baghelkhand states without a pass from the political agent or the darbar. These passes are, however, given freely to respectable persons. In the Sirchi State all travelers have to take a guide with them for the protection of life and property. No concession in fares is allowed to commercial travelers on any Indian railway.

ADMISSION OF SAMPLES.

In the four maritime provinces of Madras, Bombay, Bengal, and Burma samples imported by commercial travelers are liable to import duty if of commercial value and are admitted free if of no commercial value. A drawback of seven-eighths of the duty paid on all articles imported is granted on reexportation within three years, provided that the goods are identified to the satisfaction of the officer in charge of the custom-house at the port of final exportation. It is not necessary that the goods should be exported from the port at which they were imported. Under the orders of the government of India the provisions of section 50(a) of the sea customs act are also waived in favor of articles exported with the owners as personal baggage. No special arrangements have been made for commercial travelers whereby duty may be deposited or guaranteed, with a view to the ultimate reexportation of the goods.

Samples of goods not intended for sale

reimported by commercial travelers into British India are passed free of duty, provided that the collector of customs at the port of reimportation is satisfied (1) that duty was paid on first import, (2) of the identity of the articles, (3) that no drawback was paid on export, (4) that the ownership in the articles has not changed since its first import, and (5) that no more than six months have passed since the articles were exported.

In order to be able to claim the benefit of this concession commercial travelers must observe the following procedure: (1) When the samples are first imported into British India commercial travelers will be required to produce to the collector of customs a certificate or letter of identity from their principals or otherwise satisfy the collector of their eligibility for the concession. An invoice in duplicate showing each article in detail should be filed at the custom-house. The original will be retained by the customs authorities. Each page of the duplicate will be stamped with the custom-house seal and will be indorsed over the signature of a customs officer, with a reference to the bill of entry on which the samples were assessed to duty. It will be returned together with a certified copy of the bill of entry to the travelers. (2) The certified copy of the bill of entry must, on each occasion which the samples are exported from a port in British India to a foreign port, be produced to the customs collector of the port of export, who will indorse, after such examination of the samples as he may think necessary, the copy of the bill of entry with a certificate that no drawback had been paid, together with the date of exportation. On reimportation from a foreign port the bill of entry must similarly be produced to the collector of customs, who will indorse, after such examination of the samples as he may think necessary, the date of reimportation on the bill of entry.

When the samples are finally exported under claim of drawback, a certificate of examination shall be recorded on the certified copy of the bill of entry by a customs officer after verification of the necessary

(Continued on page 211.)

IDEAL POWER

PUBLISHED MONTHLY
In the Interest of Compressed Air
and Electrical Appliances

BY THE
IDEAL POWER PUBLISHING CO.
1014 Fisher Building
CHICAGO, U. S. A.

G. A. REES Editor

November, 1908. Vol. 5, No. 8.

TERMS OF SUBSCRIPTION

United States, Canada and Mexico, 25 cents per year
Other Countries in Postal Union, 50 cents per year

ADVERTISING RATES ON APPLICATION

Send 25 cents and have your name put on our
subscription list.

The first thing in the common sense creed is obedience. Do your work with a whole heart. Revolt is sometimes necessary, but the man who mixes revolt and obedience is doomed to disappoint himself and everybody with whom he has dealings. To flavor work with protest is to fail absolutely. When you revolt, why revolt—climb, get out, hike, defy—tell everybody and everything to go to Hell! That disposes of the case. You thus separate yourself entirely from those you have served—no one misunderstands you—you have declared yourself. But to pretend to obey, and yet carry in your heart the spirit of revolt is to do half-hearted slipshod work.—Elbert Hubbard.

The voters in the state of Illinois stamped their approval upon the issuing of \$20,000,000 of bonds for the construction of the second link of the deep waterway between the lakes and the gulf. Governor Deneen and his administration are pledged to an honest and rapid construction of the canal for which the funds have been voted. The next step is the securing of the necessary legislation by the new general assembly and it is to be hoped the legislature will do its work as promptly and effectively as did the voters. Chicago in particular and the state in general have much to feel proud of up to the present time, and we venture to predict that there will be no cause to find fault in the future. Let the good work go on.

According to the Manufacturers' Record, thirteen years ago there were gathered one evening in a winter resort hotel on the Gulf of Mexico a number of prominent public business men, including Senator Vest, Jerome Hill, a leading cotton factor of Memphis, a judge of the supreme court of Ohio and several others. One after another told the story of his estimate of the greatest man that he had met, until finally all had spoken except the judge. When his turn came he said:

"I have listened with much interest to what you have all said about great men of your acquaintance. I think I know a greater than any you have mentioned. The man I have in view is the wisest and fairest counsellor who has ever practiced in my court. He is the safest friend as an adviser I have ever known. He is the best son and the best husband of my acquaintance and the purest minded man I have ever known."

"Who is this remarkable man?" said one of the party. "He is," said the judge, "William H. Taft of Ohio, and some day, if his life is spared, he will be the president of the United States."

The prediction has been fulfilled. The consensus of opinion of the people of this country is that he measures up to that remarkable eulogy of the Ohio judge, and whose friendship the judge has long enjoyed. We believe that all the people of this country, north, south, east and west are to be congratulated that so safe and sane a counsellor, so true a friend, so high a type of citizen in private life is to be the president of this great nation. Throughout the business circles of this country there is already being felt the thrill of renewed life and activity, and activity in business means prosperity for the people.

The reports from the various manufacturing centers in which are announced the return to work of thousands of men who have been idle for months, together with the awarding of several large contracts among which is listed the contract awarded the Westinghouse Electric and Manufacturing Company by the Pennsylvania Railroad Company for the electrification of their New York terminals, beginning at Harrison, N. J., and running thence

through the tunnels under the Hudson river, under New York city, and under the East river to Jamaica, L. I.; the building of immense power plants to produce 250,000 horsepower, and the construction of 100 electric locomotives of 4,000 horsepower each, having seven-foot driving wheels and capable of making 120 miles per hour, the contract involving an expenditure of upwards of five million dollars, would seem to indicate that the United States has now entered upon a new period of broader commercial progress, of greater commercial activity, of greater railroad expansion than it has ever known in the past. The whole country deserves to be congratulated. It is generally believed, regardless of party affiliations, that the election of Judge Taft means a safe and sound administration in which laws will be enforced with vigor, but with a judicial spirit.

Passion is that haloed saint of mythical morality who so often defies duty and rapes reason.

Laughter is the world's oil and wine.

Everything always wrong is more like to mean a dead soul than a crippled liver.

She who reasons with temptation is already convinced that Eve was more saint than sinner.

Passion makes fools of philosophers, and under spur of necessity has been known to surpass more than one solomon.—Sagebrush Philosophy.

A French specialist on hypnotism has made the "discovery" that all lovers in the hysterical stage are stark, staring mad. Really wonderful—but pending an inquiry into his own sanity the procession of his toric idiocy may proceed.—Sagebrush Philosophy.

The discovery that Anna Held is the mother of a child 12 years old whom the world never heard of until now cannot be twisted into a sensation. She has rocked the boat all through life—find the miracle.—Sagebrush Philosophy.

COMMERCIAL TRAVELERS.

(Continued from page 209.)

particulars in regard to the identification of the articles and payment of duty. The certified copy of the bill of entry and the duplicate copy of the invoice shall be forwarded to the port of first importation.

In such municipalities and cantonments as levy octroi, samples of a taxable nature would be subject to that tax, and the importer would be entitled to a refund on exportation. Samples brought by commercial travelers to Ajmer-Merwara, however, are not liable to octroi. In Quetta (the only place in Baluchistan usually visited by commercial travelers) the following arrangement is in force: On arrival a list of the articles is taken at the octroi office and a sufficient sum is deposited by the importer to cover the payment of octroi duty. When the importer wishes to export his goods the unsold articles are again produced at the octroi office, and, on the list of transactions being compared with the original list, octroi is recovered on the articles sold, and the balance of the deposit returned to the importer. Exportation should take place within one month from the date of the import.

In most of the native states of India duty is levied on the value of the samples actually sold and the deposit taken for samples imported is returned if goods are not sold. Refund is allowed in Indore and Jaipur at the same post on exportation within seven days or within any other period which may be fixed; in Bikaner and the western Rajputana states, refunds are granted if the goods are exported within fifteen days or three months, respectively, of the date of import. The goods may be exported from any place within the states and by any route whether by rail or road. In Kashmir seven-eighths of the duty paid is refunded on reexportation, provided that the goods are satisfactorily identified, and that the duty exceeds 5 rupees (about \$1.60). It is not necessary in Kashmir to export goods by the post at which they entered the state. In Baroda samples brought by commercial travelers and worth more than 1 rupee (about 32 cents) are subject to customs duty according to the rates in force in the state. In Karauli a

passport entitling a commercial traveler to free passage for his goods is issued free of charge and this pass is valid for fifteen days, but duty is charged on the expiration of this period. In Bharatpur a similar passport is issued valid for one week. This period may, however, be extended to one month.

Few, if any, commercial travelers visit either the Kalat or Las Bela states, and there are no special regulations affecting commercial travelers in force in those states.

LABUAN.

[Memorandum of British Board of Trade.]

No special regulations or taxes exist affecting travelers visiting the colony, nor are they required to take out licenses to carry on their calling.

Samples of tobacco, wine, spirit, and opium are liable to duty if brought in quantity, but other goods are free from duty; rebate can always be obtained from the customs on exportation.

Licenses to sell spirit, wine, and tobacco have to be obtained; there are no other taxes except on house assessment and water rate.

MALTA.

[Report of Consul John H. Grout.]

The laws of Malta place no restriction upon and require no supervision over commercial travelers. The list of dutiable goods here are very limited. It does not apply to manufactured articles of most kinds.

A commercial traveler arriving in Malta with samples of goods coming under the dutiable list has but to sign a declaration to the effect that none of his wares are for sale, that he will not dispose of them during his visit, and that he will carry them away as he brings them. This done, he is perfectly free to pursue his vocation unhampered in any way. No discrimination is made as regards nationality of representatives or goods.

MAURITIUS.

[Memorandum of British Board of Trade.]

Commercial travelers or principals of firms visiting Mauritius are not subjected to any special tax or license charge, provided they do not intend to dispose of any

goods they may bring with them. A commercial traveler selling goods is required to pay the license fee of 100 rupees (\$32.44) per six calendar months fixed for a "commission merchant or agent who orders and receives imported goods on account of others, whether such goods be imported in his own name or not."

Samples of no commercial value are exempt from import duty; other samples are dutiable, but arrangements exist whereby they may be delivered on deposit of the amount due as duty. This deposit is returned, provided the goods are exported within three months, duty being retained for any parcel disposed of and not re-shipped.

NEW ZEALAND.

[Report of Consul-General William A. Prickitt. Land and Income Assessment Act, 1900.]

Under the land and income assessment act, 1900, commercial travelers are not permitted to carry on business in New Zealand without a "warrant" from the commissioner of taxes or the collector of customs. The warrant is issued free of charge, but the agent or traveler attempting to transact business in the colony without a warrant is liable to a penalty of from £2 to £50.

Commercial travelers are subject to the provisions of the income-tax law. In order to insure the payment of the tax, the traveler is required upon arrival in the colony to make a deposit, usually £10. Before leaving the colony the traveler is required to furnish a complete return of the value of the merchandise sold by him or for which orders have been received, and a tax of 5 per cent on the net profits resulting from such sales is charged in the case of corporate bodies and 2½ per cent in the case of private parties. The tax is levied not only on the profits from the orders taken personally by the traveler, but on the total business resulting from his visit. The assessment for the income tax is made "on the assumption that all the transactions have produced such net profit as the commissioner deems likely to have been made, being in no case less than 5 per cent of the gross proceeds resulting

from such transactions." The amount of the tax due is charged up to the deposit of £10, and the difference, if any, is returned to the traveler upon his departure; if the amount of the tax exceeds the deposit, the excess must be paid by the traveler before leaving the country.

Samples are subject to the usual rates of duty; but if the traveler intends to reexport them, he may deposit the amount due with a declaration to that effect and have the money refunded at the time of his departure after the samples have been identified by the customs officers.

SEYCHELLES.

[Memorandum of British Board of Trade.]

No special regulations exist in Seychelles affecting British commercial travelers or principals of firms visiting their customers, but under the local rate ordinance a commercial traveler may be rated in proportion to his term of residence in the colony.

If a commercial traveler imports goods for sale in Seychelles, he must be licensed either as a wholesale or retail dealer. The half-yearly license fee is as follows (1 rupee equals 32.44 cents United States currency):

	Rupees.
For a wholesale dealer.....	125
For a retail dealer for sale of all goods except spirits, wine, beer, tobacco, gold and silver wares, and opium....	15
For sale of gold and silver wares.....	15
For sale of spirits, wine, and beer (20 rupees additional for sale of spirits, etc., to be consumed on the premises)	80
For sale of tobacco.....	10
For sale of opium.....	100

Samples pay duty except when they have no value. If samples have not been unpacked, seven-eighths of the duty is refunded, provided the amount of the refund is not less than 5 rupees (\$1.62), on exportation within three years from the date of importation. The duty is payable on all goods, samples of value included, upon importation.

STRAITS SETTLEMENTS.

[Report of Vice-Consul-General G. E. Chamberlin.]

There are no laws in force discrimina-

ting between travelers of different nationalities; neither is there a tax or license of any nature.

The Straits Settlements is what is known as a free colony. The only duty in force is on beer, wine, liquor, and opium, all other articles being admitted free of duty.

Bethlehem Steel Corporation.

BRISK DEMAND FOR STRUCTURAL MATERIAL—
ORDERS AGGREGATED 20,000 TONS IN
AUGUST.

That the new special shapes of the structural mills of the Bethlehem Steel Corporation are popular with consumers is evident from the fact that the Bethlehem Co. has been receiving more business in this line than it can conveniently handle.

In the month of August the company secured orders for 20,000 tons, or more than one-third of the business placed in the United States in that month. The company secured the 8,000 ton order for the educational building in Albany, and 3,000 tons more from Boston, this steel to be used in the construction of a sugar refinery.

While government work and steel rail orders are not coming in very rapidly, all the blast furnaces of the company are in full operation and will continue to operate for a long period. It is not generally known that the Bethlehem Company has been a large seller of pig iron over the last several months. The company, in fact, has sold to many of the large eastern consumers enough iron to supply their needs for the rest of the year. It is because of this that there will be little idleness this year at the Bethlehem works so far as the production of pig iron is concerned.

The structural mills are running double turn and business on hand warrants the statement that they will be kept in operation for a period of many months.

It is surprising how near a young widow can come to proposing to a man without actually doing it.

It matters not whether a man lives well or merely exists, so long as he doesn't know the difference.

A Bright Boy.

"Say," queried the father, "can't you give my boy a position in your store?"

"I don't know," rejoined the grocer. "What can he do?"

"Well," replied the parent, "I don't suppose he could do much at first except buy and sell goods and manage your business for you, but later on when he gets a little experience and sense he might be able to sweep out, do up packages and run errands."

Stung Again.

"What a frail-looking body that poor fly has!" exclaimed the city boarder.

"Don't you fool with that frail body," rejoined the old farmer. "It belongs to a wasp, and if you get familiar you'll find it strong enough in the end."

The Only Way.

"Is there any method that will enable a man to understand a woman?" queried the innocent youth.

"The only way to understand a woman," replied the home-grown philosopher, "is not to try. Under these circumstances she will reveal herself sooner or later."

His Mistake.

"Do you know," he asked, "that an earl in England merely corresponds to a sheriff over here?"

"Mercy, no!" she replied. "You must be mistaken. My cousin Margaret married an earl, and if he makes any money from feeding prisoners it is very little. At least, Uncle John has to send them a check regularly every three months."

Nutting Time.

They had been married only three weeks and he was lifting her up on his broad shoulders to the lower branches of the giant oak.

"Am I heavy, dear?" she asked.

"No, sweetheart; I feel like Atlas," he responded, gallantly.

"But Atlas had the whole world on his shoulders."

"Well, dear, you are all the world to me."

And the squirrels ceased searching for acorns to bark their approval.

Innocence Down Home.

Mrs. Ryetop—"It just goes to show how youngsters of this generation neglect opportunities."

Mr. Ryetop—"What now, Mandy?"

Mrs. Ryetop—"Why, when Zeke was home I used to try to make him take the mop and bucket and scrub up the halls. He wouldn't pay no heed, and now he writes that he is on a scrub team up at college, and I bet he doesn't know a thing about scrubbing."

Proof of Honesty.

Silas—"Hiram Hardapple says Chicago is the most honest city in the states."

Cyrus—"What gave him that idea?"

Silas—"Why, when he was up thar he went around telling everybody he carried a dollar watch and, by heck, nobody hasn't stolen it yet."

Loss to Science.

"A funny thing happened to the keeper of the zoo the other day."

"What was that?"

"He caught and imprisoned a diplodocus."

"That wasn't funny; that was wonderful and——"

"Yes, but when he got sober he found it had escaped."—Houston Post.

Prosaic Age.

The modern Romeo climbed up the fire escape and stood beneath the balcony.

"Darling," he gurgled fervently, "I love you."

"But how do I know you speak the truth, Romeo?" responded the modern Juliet. "Men are so fickle these days."

"Fair one, I swear by yonder moon!"

Juliet laughed and showed her bridge-work.

"Why, you goose," she giggled, "that's not the moon. That's a headlight on an airship."

Pining for the days of Bill Shakespeare, the modern Romeo dropped down the fire escape just as the night watchman awoke from his nap.



A switch in time makes boys whine.

When a man is satisfied with himself he begins to shrivel up.

An apology is satisfactory only to the person who makes it.

It takes a real worry to make a big man sit up and take notice.

It's enough to discourage the tight-rope walker when business is slack.

Many a first-class talker wouldn't make even a second-class philosopher.

Some men make both ends meet by dining on oxtail soup and beef tongue.

Whisky is said to improve with age, but so many men won't let it grow old.

If absence makes the heart grow fonder it's up to the wise young man to go home early.

By and by a bunko man comes along with a new bait that fools the smartest sucker.

When you get something for nothing the something and nothing are nearly always synonymous.

No matter what the future may have in store for a woman she expects to find it among the bargains.

The brand of faith that some men expect to move mountains with wouldn't even move a mole hill.

A coat of arms doesn't always hide the family skeleton.

It isn't a secret if a woman hesitates in the telling of it.

Even a drunken man doesn't care to be held up by a footpad.

A man isn't necessarily a wood sawyer because he says nothing.

You can't flatter an honest man by telling him that he is honest.

It takes an optimist to get more good out of a thing than there is in it.

Conveniences of the age include improved wigs and better false teeth.

It's hard to work; but it's harder to be unable to get work when you want it.

When a pessimist takes unto himself a better half his worst fears are realized.

Sometimes it makes a girl blush to think how a certain young man might have kissed her, but didn't.

By covering up their tracks some men get credit for walking in the straight and narrow path.

When a man goes in for politics he generally gets rid of a lot of his money or acquires a lot of other people's.

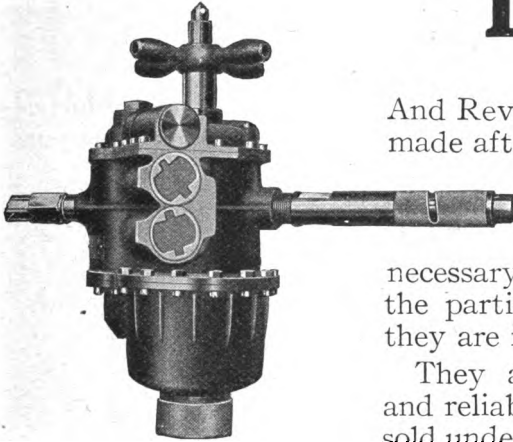
Perhaps a few more people would try to be good if they didn't bump into so many others who overdo the thing.

Missing page(s)

Missing page(s)

Missing page(s)

"LITTLE GIANT" DRILLS



**No. 1 "Little Giant" Drill
Fitted with Compound
Gearing for Heavy Drilling**

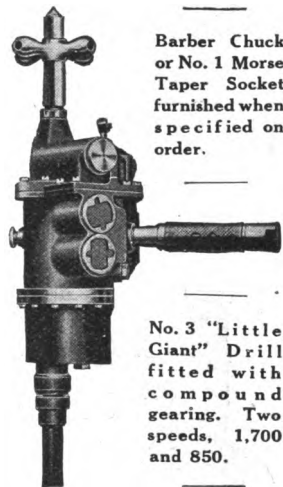
And Reversible Machines are made after a standard design or pattern, varying only in size and construction necessary to adapt them to the particular uses for which they are intended.

They are strong, durable and reliable. Every machine sold under a liberal guarantee.

**SENT ON TRIAL
AT OUR EXPENSE**

The principle of the "Little Giant" Drill has been proved to more nearly approach perfection in design than any other portable drill ever devised.

The latest types have been improved and simplified to more perfectly meet the conditions in the modern manufacturing institutions, railway shops, etc.



**Barber Chuck
or No. 1 Morse
Taper Socket
furnished when
specified on
order.**

**No. 3 "Little
Giant" Drill
fitted with
compound
gearing. Two
speeds, 1,700
and 850.**

MANUFACTURED BY

Chicago Pneumatic Tool Co.

CHICAGO

::

NEW YORK

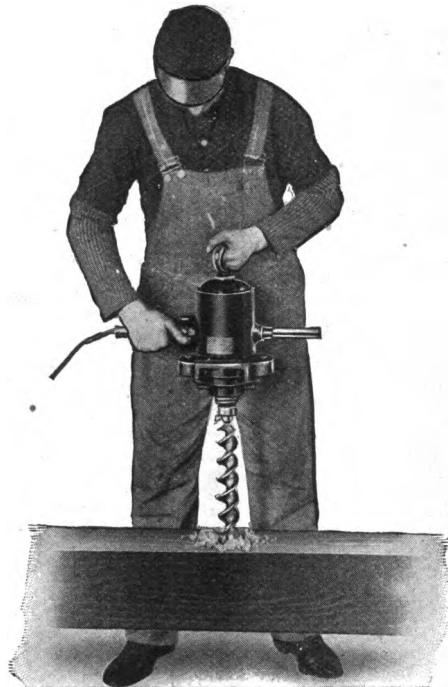
When writing to Advertisers please mention Ideal Power.



Duntley Electrical Tools

If interested
let us explain
the many
advantages
to be derived
from an
equipment
of these
modern
labor saving
devices.

To properly
meet com-
petition,
the shop
equipment
must be
kept
up-to-date.



An Alternating Current Drill applied to wood-boring

Include
Drills, Grind-
ers, (portable
and Tool Post)
Blowers,
Buffers,
Track Drills,
Spike Drivers,
Magnetic
Old Men,
etc.

Let us know
your require-
ments, and
we will
furnish
specifications
and prices to
meet them.

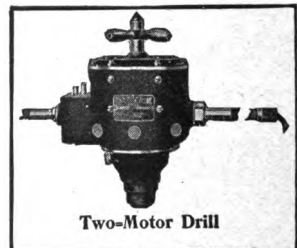
Tools sent on trial to responsible
parties at our expense.

Manufactured by

CHICAGO PNEUMATIC TOOL COMPANY

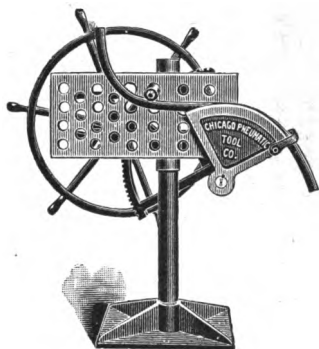
Chicago

New York



When writing to Advertisers please mention Ideal Power.

"CHICAGO" PIPE BENDING MACHINE



A very simple machine—yet obtains wonderful results. One man can bend a 2" pipe to an S bend in three minutes—no other assistance or device needed.

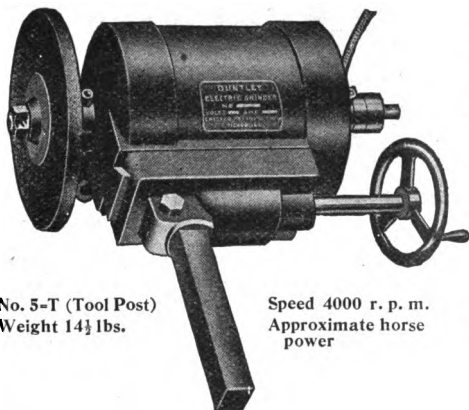
Being light in weight it is easily moved about the shop or from job to job. Durable design and structure.

Write for particulars.

Manufactured by

Chicago Pneumatic Tool Co.
CHICAGO ————— NEW YORK

"DUNTLEY" Electric Grinders



No. 5-T (Tool Post)
Weight 14½ lbs.

Speed 4000 r. p. m.
Approximate horse
power

Manufactured in a number of sizes and styles to meet all machine shop requirements.

Let us know the conditions in your shop and we will prescribe a machine to do the work.

Full line illustrated and described in

Bulletin No. E-5

MANUFACTURED BY

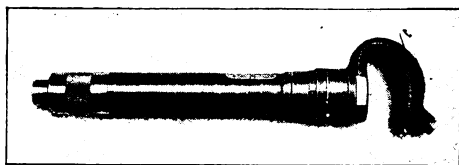
CHICAGO PNEUMATIC TOOL COMPANY
CHICAGO ————— NEW YORK

When writing to Advertisers please mention Ideal Power.

THE SYNONYMS OF PROGRESS AND THRIFT ARE BOYER AND KELLER HAMMERS

They have represented a Movement forward, Completeness of Shop Equipment, Perfection in Business Management to the highest point of possible attainment, Gain, and Prosperity. Hence their adoption as standard everywhere.

Sent
On Trial
At Our
Expense



No. 80 BOYER RIVETING HAMMER
Equipped with M-S Tool Holder. We can apply tool holder to any riveting hammer. Write us and we will tell you more about it.

Sold
Under
Liberal
Guarantee

Riveting Hammers are used for many other purposes than for driving of rivets.

If interested write us and we will cheerfully furnish facts and figures. A line today may save many dollars tomorrow.

MANUFACTURED BY

Chicago Pneumatic Tool Company

CHICAGO—NEW YORK



Boyer Chipping and
Calking Hammer
Size BB



Keller Chipping and
Calking Hammer
Size 4

When writing to Advertisers please mention Ideal Power.

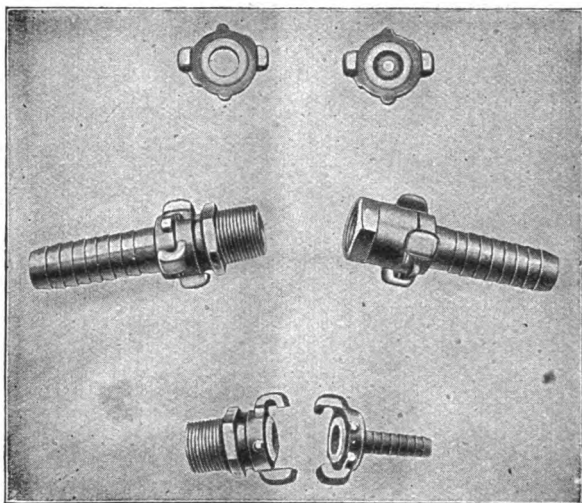
Missing page(s)

The Chicago Hose Coupler

Is the only universal coupler yet devised.

Each half is the same in style and size whether for $\frac{1}{4}$ -inch or inch hose, therefore couple anywhere.

Fully described in Special Circular No. 53.



All large manufacturing institutions and railway shops are adopting them as a standard. They soon pay for themselves in saving of time.

MANUFACTURED BY

Chicago Pneumatic Tool Company

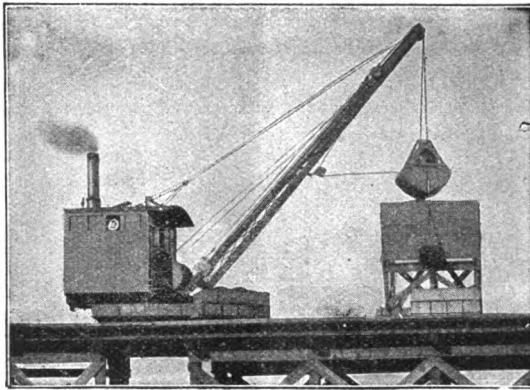
CHICAGO—NEW YORK

When writing to Advertisers please mention Ideal Power.

Missing page(s)

Don't Let Your Coal Cost You So Much

THERE IS NO NEED OF IT



THE BROWNING LOCOMOTIVE
CRANES WORK MOST
EVERYWHERE,
ON EARTH AND ABOVE IT!

Send for Bulletin No. 35-U

The Browning Engineering Co.
Cleveland, Ohio

When writing to Advertisers please mention Ideal Power.

THE CHICAGO PNEUMATIC T O O L C O M P A N Y

MANUFACTURE THE FOLLOWING
PNEUMATIC TOOLS, APPLIANCES, ETC.

After Coolers
Air Compressors,
Franklin
Air Forge, Chicago
Air Motors
Air Receivers
Air Jacks
Airoilene
Airoilene Grease
Angle Gears, Little Giant
Angle Gears, Boyer
Annealing Machines
Armour Scaling Machines
Automatic Oiling Devices
Bell Ringers, Little Giant
Blow-off Cocks, Little Giant
Chucks, Expanding
Cranes
Drift Bolt Drivers
Drills, Boyer
Drills, Keller
Drills, Little Giant
Drills, Phoenix Rotary No. 3
Drills, Rock
Drills, Moffett Steam
Drilling Stands
Elevators
Electric Drills, Duntley
Electric Grinders, Duntley
Engineers' Valves
Flue Cutters, Chicago

Flue Rollers, and Ex-
panders, Little Giant
Grinders, Portable Electric
Hammers, Riveting
Hammers, Chipping and
Calking
Hammers, Stone
Hoists, Duntley Electric
Hoists, Pneumatic Geared
Hoists, Straight Lift
Holders-on
Hose, Special High Grade
Hose Clamp Tool
Hose Couplings (Universal)
Inter-Coolers
Magnetic Old Man
Painting Machines
Pipe Bending Machines
Reamers
Reheaters
Riveters, Jam
Riveters, Yoke
Riveters, Compression
Sand Rammers
Sand Sifters
Speed Recorders
Staybolt Chucks
Stone Dressers
Staybolt Nippers
Vacuum Pumps
Winches, Portable

Missing page(s)

THE STANDARD TOOL CO'S

TWIST



DRILLS

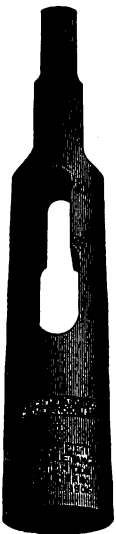


CARBON OR HIGH SPEED

The material used, clearance, point and temper all unite to make a tool that is well adapted for use in pneumatic drills.

**Office and Factory,
CLEVELAND, O.**

**Eastern Salesroom,
94 Reade St., NEW YORK**



END YOUR TANG TROUBLES RECLAIM YOUR SCRAP HEAP

It Is Easy to Do Both With

“PERFECT DOUBLE-TANG” SOCKETS

They fit any drill press or lathe spindle having a regular taper hole.

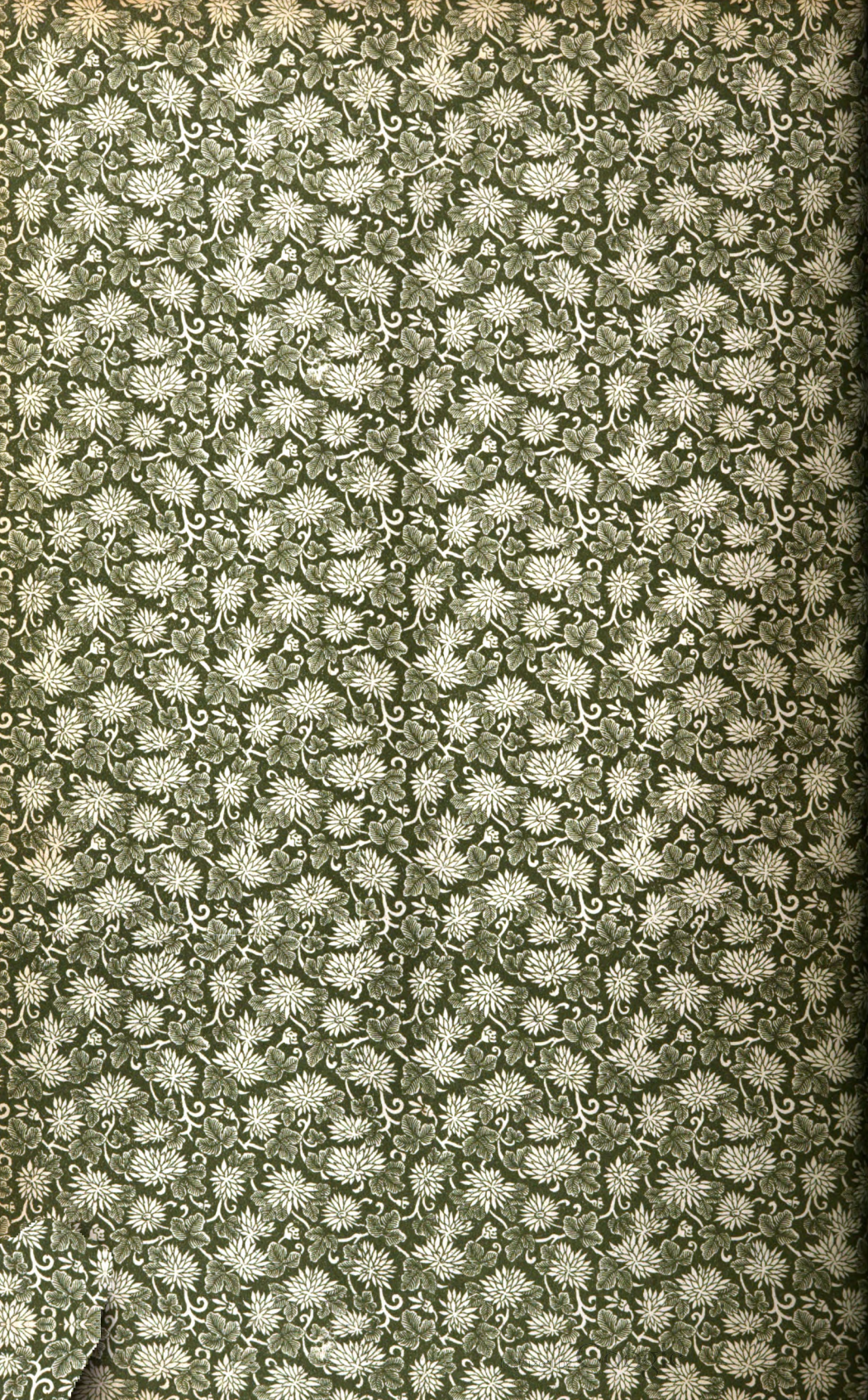
Three minutes' grinding puts the second tang on your drill—it is 25% to 60% thicker than the original tang according to the size of shank. The Double-Tang Socket does the rest.

Write for Booklet “B” and Discounts.

(PATENTED)

The ~~CLEVELAND~~ Twist Drill Co
NEW YORK  CLEVELAND, O.  CHICAGO

When writing to Advertisers please mention Ideal Power. 





UNIVERSITY OF MINNESOTA



3 1951 D00 450 163 5

Minnesota Library Access Center



9 ZA R01 D12 S14 TL 2